



DEPARTMENT OF TRANSPORTATION  
NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D. C. 20591

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OFFICE OF  
THE CHAIRMAN

September 15, 1970

Honorable John H. Shaffer  
Administrator  
Federal Aviation Administration  
Department of Transportation  
Washington, D. C. 20590

Dear Mr. Shaffer:

For a number of years, the Board has been concerned about the number of accidents caused by fatigue failures in the tail rotor blades of Bell Model 47 helicopters. This has resulted in the FAA issuing Airworthiness Directives as deemed necessary. Subsequent to the issuance of AD 68-2-3, effective January 19, 1968, and prior to January 10, 1970, we had only limited knowledge of one additional fatal accident due to a fatigue failure of a Bell Model 47 tail rotor blade which occurred in Bern, Switzerland, on November 21, 1968.

However, on January 10, 1970, another fatal accident occurred approximately 7 1/2 miles north of Healy, Alaska, due to another fatigue failure separation of a tail rotor blade. The helicopter involved, an altered Bell Model 47J-2, N944NA, operated by Anchorage Helicopters, crashed on the ice-covered Nenana River after sustaining the in-flight separation.

Although AD 68-2-3, requiring an inspection with a three-power or higher magnifying glass before the first flight of each day and before the flight after refueling, was being complied with, the metallographic examination of the failed tail rotor blade, P/N 47-642-102, S/N A3-56109, disclosed that the fatigue originated at the trailing edge surface of the blade, approximately 2 3/4 inches above the root end, and progressed in a circumferentially chordwise direction. The failure of this blade occurred in a more rapid progression than the other similar fatigue fractures

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in this area, indicating the possibility of an unusual blade loading. The total operational time on the blade was 221 hours which is well within the 600-hour retirement life.

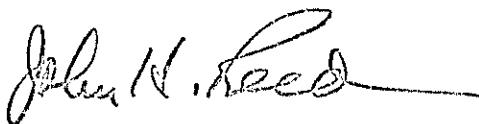
Examination of the logbooks disclosed a copy of a Maintenance Repair and Alteration FAA Form 337 for the removal of the two Bell float assemblies, P/N 47-351-014-3, and the installation of two Goodyear 4053-111 floats, on a Bell helicopter Model 47J-2A, S/N 3115, N3077G, being instituted by Certificated Repair Station #4790. A diligent search failed to reveal the proper 337 Form for this altered configuration or the spoilers, P/N 47-706-212-1 of Bell Model 47J-2, S/N 1856, N944NA, that are required in the Bell FAA-approved Service Instructions for installing float landing gear.

We believe that this float installation not only changed the operating limitations and flight data contained in the approved aircraft flight manual, but created the unusual blade loading which resulted in the subsequent fatigue and ultimate separation.

Therefore, we recommend that all Bell 47 Model helicopters, equipped with fixed flotation assemblies that have not been approved by the manufacturer, be restricted from further flight until the Airworthiness Standards requirements of Parts 27.413, 27.571, and 27.1503 have been evaluated and approved for this type of installation.

Personnel of your Alaskan and Southwestern Regions and Washington offices have been contacted concerning this matter and our staff is available for further assistance if required.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "John H. Reed", with a long horizontal flourish extending to the right.

John H. Reed  
Chairman